Amendments to the Claims

This listing of claims will replace all prior versions, and listings of claims in the application:

Claims 1-20 (canceled)

Claim 21. (currently amended) An isolated polynucleotide ~~comprising~~ consisting of:

(a) a nucleotide sequence encoding a polypeptide having sodium channel agonist~~toxin~~ activity, wherein the polypeptide has an amino acid sequence of ~~at least 95% sequence identity, based on the Clustal V method of alignment, when compared to~~ SEQ ID NO:9, or

(b) a complement of the nucleotide sequence, wherein the complement and the nucleotide sequence consist of the same number of nucleotides and are 100% complementary.

22. (canceled)

23. (currently amended) The polynucleotide of Claim 21 wherein the nucleotide sequence ~~comprises~~ is SEQ ID NO:8.

24. (previously presented) A vector comprising the polynucleotide of Claim 21.

25. (previously presented) A recombinant DNA construct comprising the polynucleotide of Claim 21 operably linked to at least one regulatory sequence.

26. (currently amended) A method for transforming a cell, comprising transforming a cell with the ~~polynucleotide~~ recombinant DNA construct of Claim 25 ~~1~~.

27. (previously presented) A cell comprising the recombinant DNA construct of Claim 25.

28. (currently amended) A method for producing a plant comprising transforming a plant cell with the ~~polynucleotide~~ recombinant DNA construct of Claim 25 ~~1~~ and regenerating a plant from the transformed plant cell.

29. (previously presented) A plant comprising the recombinant DNA construct of Claim 25.

30. (previously presented) A seed comprising the recombinant DNA construct of Claim 25.

31. (previously presented) A method for isolating a polypeptide having toxin activity comprising isolating the polypeptide from a cell or culture medium of the cell, wherein the cell comprises a recombinant DNA construct comprising the polynucleotide of Claim 21 operably linked to at least one regulatory sequence.

32. (newly added) An isolated polynucleotide encoding amino acids 1-19 of SEQ ID NO:9.

33. (newly added) An isolated polynucleotide encoding amino acids 20-84 of SEQ ID NO:9.

REMARKS

Claim 22 is canceled, thus Claims 21, and 23-31 are in the application. Claims 21 and 26 are amended in the present response.

Claim 21 is amended to remove the percent identity and to specify that the polynucleotides encode polypeptides having sodium channel agonist activity. Support for this last change is found in the specification as filed, for example, on page 17, line 8.

Claim 26 is been amended to correct the dependency to Claim 25.

Claims 32 and 33 are newly added. Support for these claims is found in the specification as filed, on page 18, lines 31-33.

The specification is amended to comply with the requisites for receiving the benefit of an earlier filing date.

The amendments to the claims make the 35 U.S.C. §101 and §112 rejections moot. The specification teaches that identification of the function of the polypeptides of the invention was performed using BLAST analysis. See for example specification, page 17, lines 8-24 where it is stated that ESTs encoding scorpion sodium channel agonists were identified by conducting BLAST analyses.

The structural elements of scorpion alpha neurotoxins have been identified by Zilberberg et al. (JBC, of record). These neurotoxins are the most abundant in scorpion venoms and the most studied ones. The mature protein contains 8 cysteines forming four disulfide bridges to maintain a compact globular structure. According to Zilberberg et al. immediately prior to the first cysteine alpha neurotoxins have a stretch of 5 amino acids that is different for those more efficient against insects than for those more efficient against mammals. In alpha neurotoxins that are more efficient against insects this stretch reads LysAsnTyrAsnCys while in the ones that are more efficient against mammals this stretch reads AspAspValAsnCys. In the amino acid sequence of SEQ ID NO:9 this stretch reads GluAsnTyrAsnCys which indicates that the neurotoxin of SEQ ID NO:9 should be more efficient against insects than mammals. Since the polynucleotide of the invention encodes a toxin which is more efficient against insects, its activity will be tested as explained in the specification as filed on page 16, lines 6 through 11.

Thus, the polynucleotide of the present invention has a specific and clear utility and is enabled.

In view of the foregoing amendments and remarks, allowance of the above-referenced application is respectfully requested.

Respectfully submitted,

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